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In triple negative breast tumor cells, PLC-β2 promotes the conversion of CD133^{high} to CD133^{low} phenotype and reduces the CD133-related invasiveness

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Beyond its possible relationship with stemness of tumor cells, CD133/prominin is a highly glycosylated trans-membrane protein that correlates with tumor size, metastasis and clinical stage of triple negative breast cancers (TNBC), that represent 20% of all breast tumors and have a particularly worse clinical outcome than other tumor subtypes [1]. The correlation between the levels of CD133 expression and the biology of breast tumor cells was studied in CD133^{low} and CD133^{high} cell subpopulations isolated from MDA-MB-231 cells (ER-, PR-, HER2-). High expression of CD133 characterizes a small percentage of cells with larger adhesion area, lower proliferation rate, higher invasion capability and increased expression of proteins involved in metastasis and drug resistance of breast cancers. PLC-β2 expression, that plays a crucial role in malignancy of breast tumor cells [2, 3], inversely correlates with the levels of CD133 and has a role in inducing the CD133^{high} cells to CD133^{low} cells conversion. The forced up-regulation of PLC-β2 counteracts the invasiveness of CD133^{high} MDA-MB-231, suggesting that, in TNBC, the de-regulation of this PLC isozyme is responsible of the switch from an early to a mature tumoral phenotype also by reducing the expression of CD133. These data might contribute to identify unexplored key steps in TNBC malignancy, to be considered for potential therapeutic strategies.

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References

[1] Zhao et al. (2011) Clinicopathological significance and prognostic value of CD133 expression in triple-negative breast carcinoma. Cancer Sci 1111: 1349-7006.
[2] Bertagnolo et al. (2006) PLC-beta2 is highly expressed in breast cancer and is associated with a poor outcome: a study on tissue microarrays. Int J Oncol 28: 863-872.
[3] Bertagnolo et al. (2007) Phospholipase C-beta 2 promotes mitosis and migration of human breast cancer-derived cells. Carcinogenesis 28: 1638-1645.

Key words
Triple negative breast cancer, CD133, cell invasion, PLC-β2.